

NHA	USED ON	MOD	LTR	DESCRIPTION	DATE	APPROVED
	412		-	Initial Release	12/05/93	<i>Hille</i>

HISTORY
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ECO # *Chgd. 12-15-93*

	DRN <i>MC</i>	12/9/93	PREMIER AVIATION, INC. GRAND PRAIRIE - TEXAS		
	CHK				
	APP				
	CONTRACT		STATIC TEST OF THE BELLY-MOUNTED SX-16 NIGHTSUN INSTALLED ON THE BHTI 412 HELICOPTER		
	PREMIER APP <i>Hille</i>	SIZE	CODE IDENT NO.	DWG NO.	
		A	OSUV8	E93-304	
	CUST. APP	SCALE: N/A		SHEET: 1 of 7	

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ORIGINAL

E93-304 (REV -) AS 77215315

PREMIER AVIATION ENGINEERING REPORT NO. E93-304

STATIC TEST OF THE BELLY-MOUNTED SX-16 NIGHTSUN
INSTALLED ON THE BHTI 412 HELICOPTER,

STC SH7744SW

PART I: TEST PLAN

HISTORY

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BY:



Martin R. Crane

STATIC TEST OF THE BELLY-MOUNTED
SX-16 NIGHTSUN INSTALLED ON THE BHTI 412
HELICOPTER

SIZE

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SCALE: N/A

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STC SH 7744 SW

INTRODUCTION

This report documents a static test of a belly mounted SX-16 Nightsun system on a Model 412 helicopter installed in accordance with STC SH7744SW and Premier Master Drawing List B00-13014, Rev. A, dated 12/23/92. The test is being performed at the request of BHTC in order to approve the installation of the SX-16 Nightsun at BHTC. Compliance with FAR 29.303, 29.307, 29.337 will be shown by this static test.

In accordance with the test plan a downward and drag load will be applied assuming the center of gravity of the installation to be located at the gimbal pivot axis on centerline of the Nightsun assembly. The downward load simulates the limit maneuvering load factor of 3.5 g's and will be applied simultaneously with the drag load.

In addition to the static test, the clearance between the bottom of the Nightsun and the ground will be measured with the aircraft off the ground with no load on the skid gear.

The question of compatibility with the high skid gear configuration only is a matter addressed on the face of the STC, "Compatibility of this modification with previously installed equipment must be determined by the installer." There is no need to state this on the drawing.

The testing will be conducted at the Premier Aviation, Inc. facility at the Grand Prairie municipal airport. The test will be conducted by Premier Aviation personnel and will be witnessed by a Premier Aviation official representative and a BHTI representative.

The report will be updated with a PART II: TEST RESULTS, upon successful completion of the test.

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TEST LOADS

The test loads to be applied to the installation of the SX-16 Nightsun are described below. To preclude any possible damage to the Nightsun due to application of these loads, a test fixture will be used to apply the loads through the c.g. of the nightsun.

The weight of the Nightsun and gimbal is 37 lbs.
The mounting provision weighs 3 lbs.

Downward load:

Basis: Pt. 29.337, Limit Maneuvering Load Factor

Load = weight * g's * load factor
Load = (37 + 3) (3.5 g's) (1.5) = 210 lbs.

Downward Load = 210. lbs.

Drag load:

$$D = C_D \frac{1}{2} \rho V^2 A$$

Drag coefficient, $C_D = 1.12$
Density, $\rho = 0.002377$ slugs/ft³
Velocity, $V = 154$ Kts = 260 ft/sec
Frontal Area, $A = 1.833$ ft²

Drag Load = 165 lbs.

The downward load will be applied simultaneously with the drag load.

At the conclusion of the test, all test hardware will be inspected for any evidence of permanent deformation, damage or failure. If none is found, the test will be considered successful.

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HELICOPTER

SIZE

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A

OSUV8

E93-304

SCALE: N/A

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STC 517744S W

GROUND CLEARANCE MEASUREMENT

The clearance between the bottom of the Nightsun and the ground will be measured with the aircraft off the ground with no load on the skid gear.

This will be accomplished with the Nightsun in the stowed position. The aircraft will be lifted with jacks or other provisions so that the skid gear is just off the ground with no weight on the gear. The minimum clearance of the Nightsun above the ground will be measured.

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SCALE: N/A

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MS 4745W
STCS 744SW

FIGURE 1. SX-16 NIGHTSUN INSTALLATION DURING APPLICATION OF THE
COMBINED DRAG AND DOWNWARD MANEUVER LOADING.

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FIGURE 2. SX-16 NIGHTSUN GROUND CLEARANCE MEASUREMENT IN PROGRESS.

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AS 742 HCSIS
STCSH 744 SW